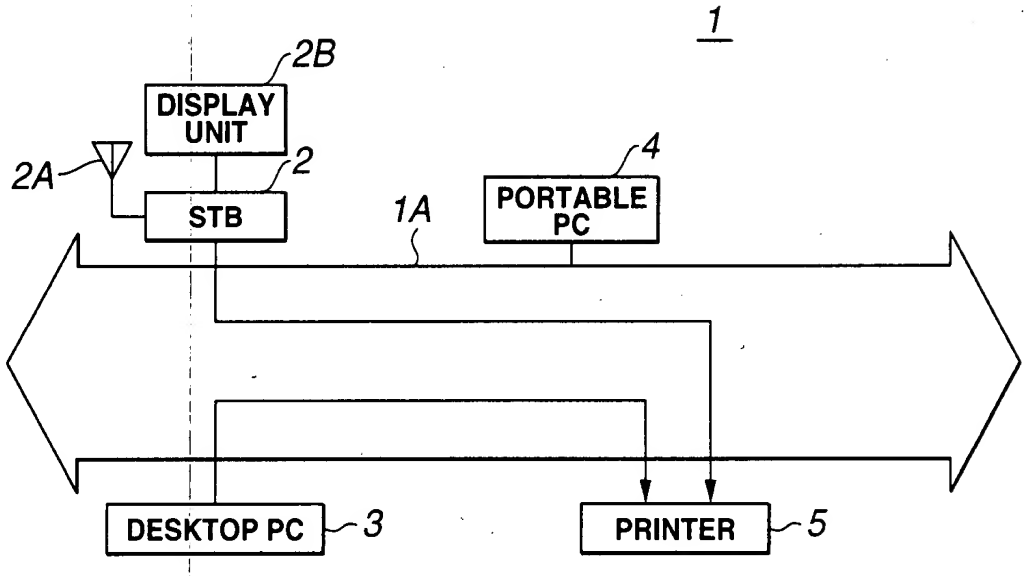

FIG.1

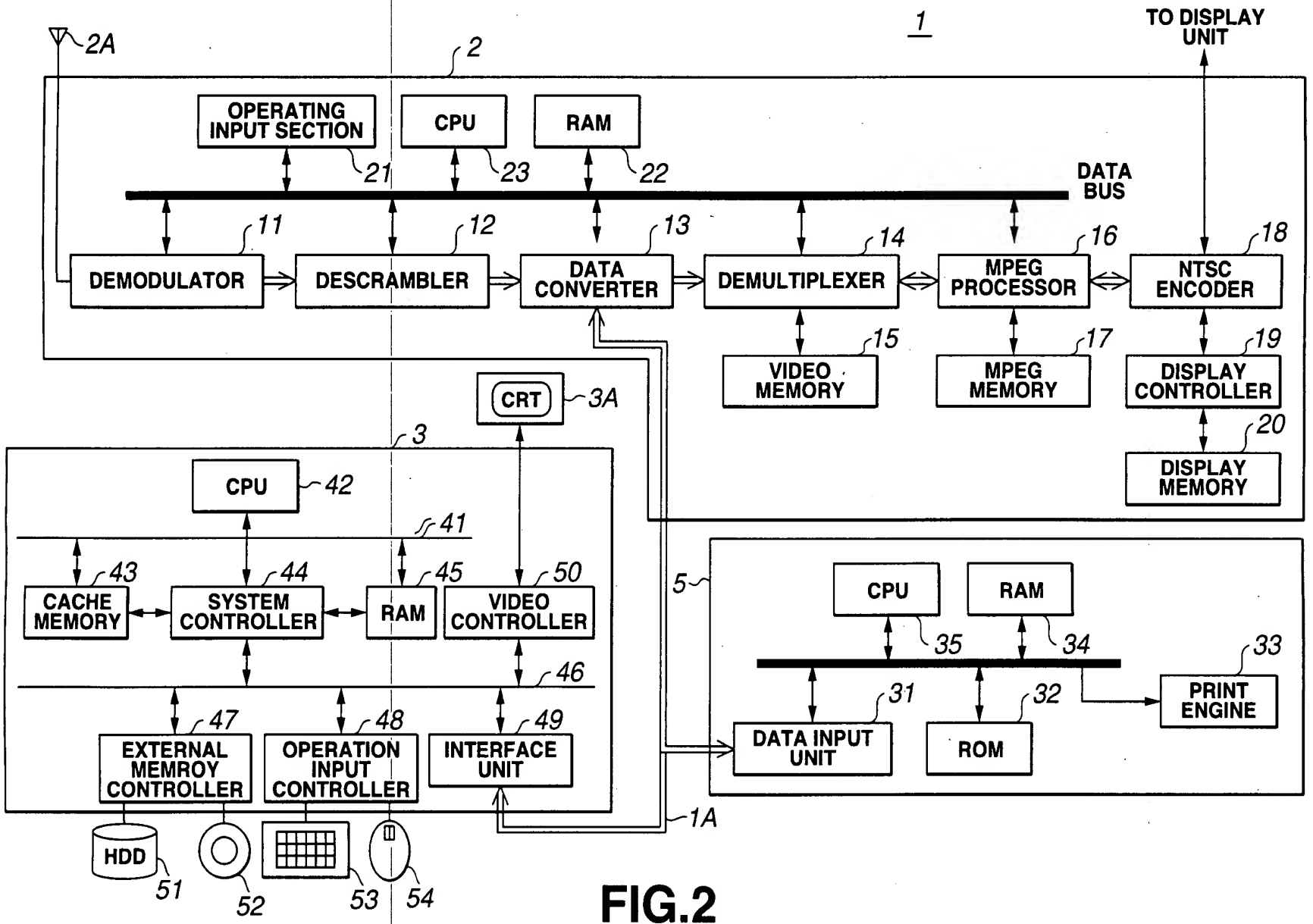

FIG.2

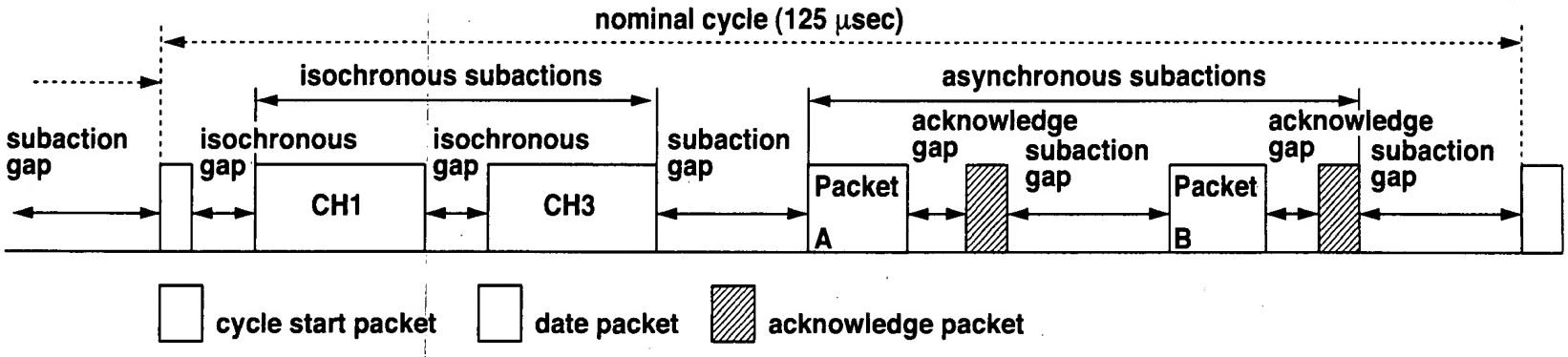

FIG.3

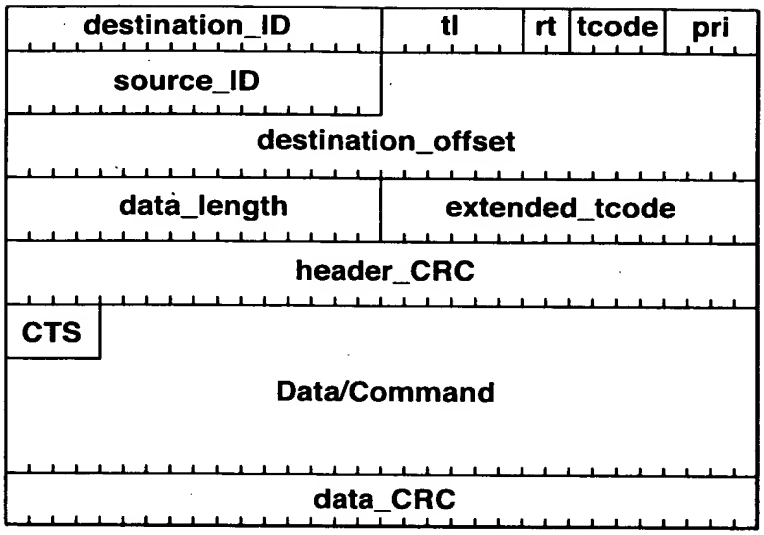
destination_ID
tl
rt
tcode
pri
source_ID
destination_offset
data_length
extended_tcode
header_CRC
CTS
Data/Command
data_CRC

FIG.4

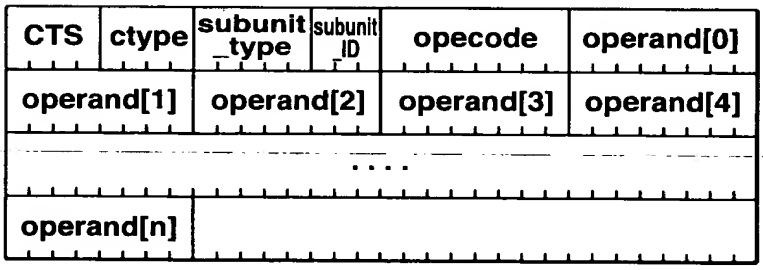
CTS
ctype
subunit _type
subunit _ID
opecode
operand[0]
operand[1]
operand[2]
operand[3]
operand[4]
....
operand[n]

FIG.5

	msb							lsb
opcode	OPERATION MODE(41_{16})							
operand [0]	subfunction							
operand [1]	status							
operand [2]	next_pic							
operand [3]	next_page							
operand [4]								
operand [5]	print_job_ID							
⋮								
operand [16]								
operand [17]	Operation_mode_parameters							
⋮								
operand [24]								
operand [25]	Operation_mode_optional_parameters							
⋮								
operand [29]								
operand [30]	reserved							
operand [31]								
operand [32]								

FIG.6

Address Offset	Contents
00_{16}	media_type
01_{16}	Media_size
02_{16}	
03_{16}	
04_{16}	reserved
05_{16}	Print_quality
06_{16}	Mono_color
07_{16}	offset
08_{16}	
09_{16}	
$0A_{16}$	
$0B_{16}$	Layout_type
$0C_{16}$	
$0D_{16}$	
$0E_{16}$	

FIG.7

	msb							lsb
opcode	CAPTURE(42_{16})							
operand [0]	subfunction							
operand [1]	source_subunit_type						source_subunit_ID	
operand [2]	source_plug							
operand [3]	status							
operand [4]	dest_plug							
operand [5]	print_job_ID							
.								
.								
operand [16]								
operand [17]	data_size							
operand [18]								
operand [19]								
operand [20]								
operand [21]	image_size_x							
operand [22]								
operand [23]	image_size_y							
operand [24]								
operand [25]	image_format_specifier							
operand [26]								
operand [27]	reserved							
operand [28]								
operand [29]								
operand [30]	Next_pic							
operand [31]	Next_page							
operand [32]								

FIG.8

Value(MSB)	Value(LSB)	Type	Meaning
00_{16}	sRGB raw		
	00_{16}	sRGB raw	
	01_{16}	sRGB raw,quadlet	
01_{16}	YCC raw		
	$0X_{16}$	YCC4:2:2 raw/pixel	
	$1X_{16}$	YCC4:2:2 raw/line	
	$8X_{16}$	YCC4:2:0 raw/pixel	
	$9X_{16}$	YCC4:2:0 raw/line	
	$X0_{16}$	Pixel ratio 1.00×1.00 / ITU-R BT.709-2 / interlace	
	$X1_{16}$	Pixel ratio 1.19×1.00 / ITU-R BT.709-2 / interlace	
	$X2_{16}$	Pixel ratio 0.89×1.00 / ITU-R BT.709-2 / interlace	
	$X3_{16}$	Pixel ratio 0.89×1.00 / ITU-R BT.601-4 / interlace	
	$X8_{16}$	Pixel ratio 1.00×1.00 / ITU-R BT.709-2 / progressive	
	$X9_{16}$	Pixel ratio 1.19×1.00 / ITU-R BT.709-2 / progressive	
	XA_{16}	Pixel ratio 0.89×1.00 / ITU-R BT.709-2 / progressive	
	XB_{16}	Pixel ratio 0.89×1.00 / ITU-R BT.601-4 / progressive	
10_{16}	DCF Object		
	00_{16}	Exif 2.1	
	01_{16}	JFIF	
	02_{16}	TIFF	
	$0F_{16}$	JPEG	

FIG.9

Value (MSB)	Value (LSB)	Type	Meaning
40_{16}	Page Description Language		
	03_{10}	PCL	HP-GL/2 is included as part of the PCL language (PCL and HP-GL/2 are registered trademarks of Hewlett-Packard Company.)
	04_{10}	HP-GL	Hewlett-Packard Graphics Language (HP-GL is a registered trademark of Hewlett-Packard Company.)
	05_{10}	PJL	Peripheral Job Language (Hewlett-Packard Co.)
	06_{10}	PS	PostScript Language (Postscript is a trademark of Adobe Systems Incorporated.)
	07_{10}	IPDS	Intelligent Printer Data Stream (IBM)
	08_{10}	PPDS	IBM Personal Printer Data Stream (Lexmark International,Inc.)
	09_{10}	EscapeP	ESC/P (Epson Corp.)
	10_{10}	Epson	(Epson Corp.)
	11_{10}	DDIF	Digital Document Interchange Format (Digital Equipment Corp.)
	12_{10}	Interpress	(Xerox Corp.)
	13_{10}	ISO6429	Control functions for Coded Character Sets (ISO Standard)
	14_{10}	LineData	Lines of data as separate ASCII or EBCDIC records and containing no control functions(no CR,LF,HT,FFetc.).(See ISO 10175 Document Printing Application(DPA)) (ISO Standard)
	15_{10}	MODCA	Mixed Object Document Content Architecture (IBM)
	16_{10}	REGIS	Remote Graphics Instruction Set (Digital Equipment Corp.)
	17_{10}	SCS	SNA Character String Bi-directional print data stream for SNA LU-1 mode of communications (IBM)
	18_{10}	SPDL	ISO 10180 : Standard Page Description Language (ISO Standard)
	19_{10}	TEK4014	Tektronix 4014 Graphics Terminal (Tektronix Corp.)

FIG.10

Value (MSB)	Value (LSB)	Type	Meaning
	20_{10}	PDS	
	21_{10}	IGP	(Printronix Corp.)
	22_{10}	CodeV	Magnum Code-V,Image and printer control language (QMS,Inc)
	23_{10}	DSC-DSE	Data Steam Compatible and Emulation Bi-directional print data stream for non-SNA(DSC) and SNA LU-3 3270 controller (DSE) communications (IBM)
	24_{10}	WPS	Windows Printing System (Microsoft Corporation.)
	25_{10}	LN03	Early DEC-PPL3 (Digital Equipment Corp.)
	26_{10}	CCITT	
	27_{10}	QUIC	Quality Information Code (QMS,Inc)
	28_{10}	CPAP	Common Printer Access Protocol (Digital Equipment Corp.)
	29_{10}	DEC-PPL	Degital ANSI-Compliant Printing Protocol (Digital Equipment Corp.)
	30_{10}	Simple Text	character coded data,including NUL,CR,LF, HT,and FF control characters,(See ISO 10175 Document Pinting Application(DPA)) (ISO Standard)
	31_{10}	NPAP	Network Printer Alliance Protocol(This protocol has been superseded by the IEEE1284. 1 TIPSI Std (ref,TIPSI=49_{10}))
	32_{10}	DOC	Document Option Commands (QMS,Inc)
	33_{10}	ImPRESS	(QMS,Inc)
	34_{10}	Pinwriter	24 wire dot matrix printr for USA,Europe,and Asia except Japan. (NEC)
	35_{10}	NPDL	Page printer for Japanese market (NEC)
	36_{10}	NEC201PL	PC-PRO201 Series:Serial printer language used in the Japanese market. (NEC)
	37_{10}	Automatic PDL sensing	Automatic sensing of the interpreter language family by the printer examining the document content.Which actual interpreter language families are sensed depends on the printer implementation.
	38_{10}	Pages	Page printer Advanced Graphic Escape Set (IBM Japan)
	39_{10}	LIPS	LBP Image Processing System

FIG.11

Value (MSB)	Value (LSB)	Type	Meaning
	40_{10}	TIFF	Tagged Image File Format (Aldus)
	41_{10}	Diagnostic	A hex dump of the input to the interpreter
	42_{10}	PSPrinter	The PostScript Language used for control (with any PDLs) (Adobe Systems Incorporated)
	43_{10}	CaPSL	Canon Print Systems Language (Canon Inc.)
	44_{10}	EXCL	Extended Command Language (Talaris Systems Inc.)
	45_{10}	LCDS	Line Conditioned Data Stream (Xerox Corporation)
	46_{10}	XES	Xerox Escape Sequences (Xerox Corporation)
	47_{10}	PCLXL	Printer Control language.Extended language features for printing,and printer control. (Hewlett-Packard Co.)
	48_{10}	ART	Advanced Rendering Tools (ART IV) (Fuji Xerox Co.,Ltd.)
	49_{10}	TIPSI	Transport Independent Printer System Interface (ref.IEEE Std.1284.1)
	50_{10}	Prescribe	Technical reference manual: "PRESCRIBE II Programming Manual"
	51_{10}	LinePrinter	A simple-text character stream which supports the control codes LF,VT,FF,and plus Centronics or Dataproducts Vertical Format Unit(VFU) language
	52_{10}	IDP	Imaging Device Protocol (Apple Computer.)
	53_{10}	XJCL	Xerox Job Control Language (JCL) (Fuji Xerox Co.,Ltd.)
	54_{10}	PDF	Adobe Portable Document Format (Adobe Systems,Inc.)
	55_{10}	RPDL()	Ricoh Page Description Language for printers (RICHO,Co.LTD)
	56_{10}	IntermecIPL	Intermec Printer Language for label printers (Intermec Corporation)
	57_{10}	UBIFingerprint	An intelligent basic-like programming language for label printers. (United Barcode Industries)
	58_{10}	UBIDirectProtocol	An intelligent control language for label printers. (United Barcode Industries)
	59_{10}	Fujitsu Printer Language	(FUJITSU LIMITED)
80_{16}~ $8F_{16}$	59_{16}~ FF_{16}	Vendor Dependent format	
FE_{16}	Special meaning		
	00_{16}	Unit Plug defined	
	01_{16}	Don't care	

FIG.12

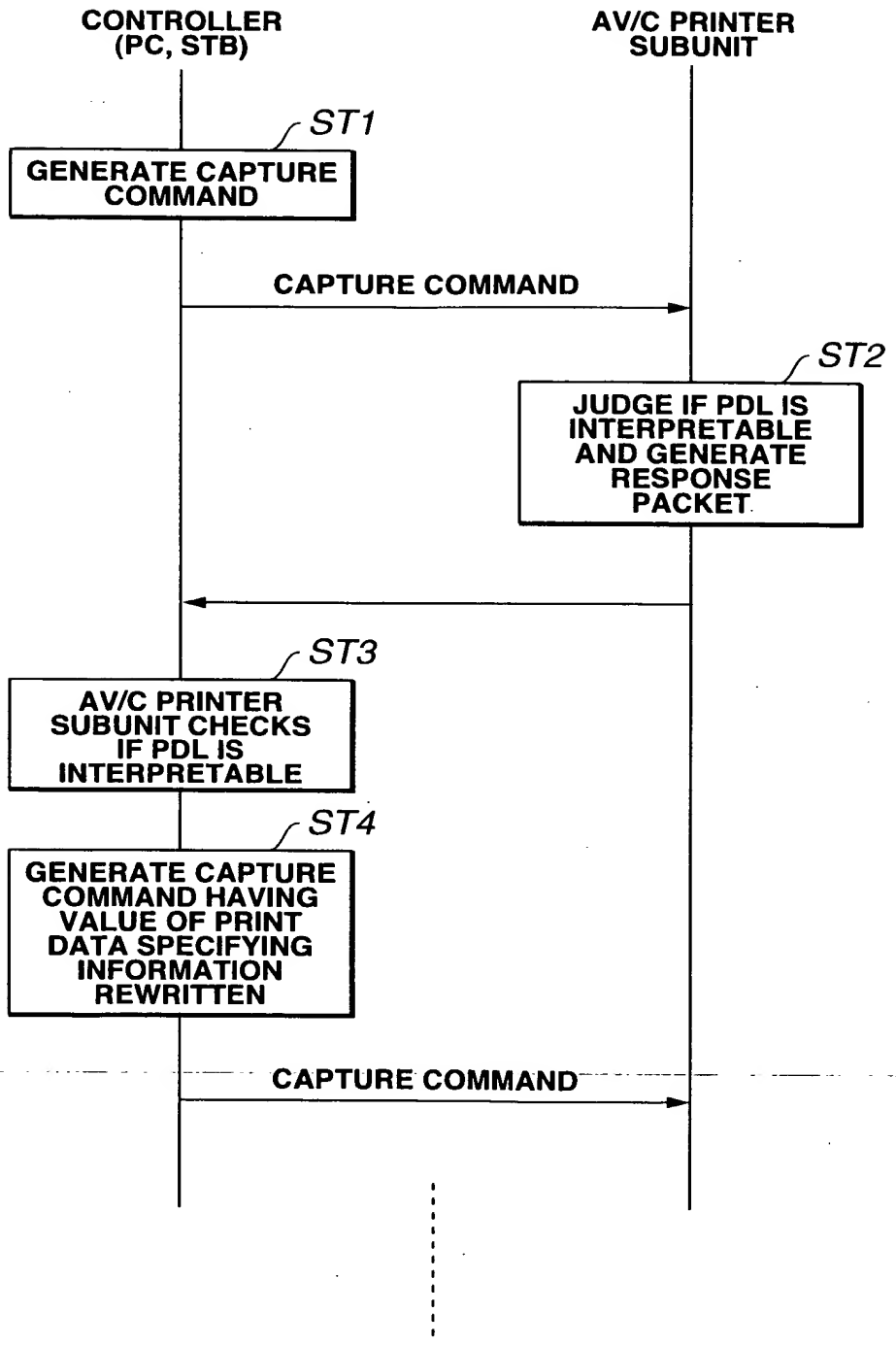
CONTROLLER
(PC, STB)
AV/C PRINTER
SUBUNIT
ST1
GENERATE CAPTURE COMMAND
CAPTURE COMMAND
ST2
JUDGE IF PDL IS INTERPRETABLE AND GENERATE RESPONSE PACKET
ST3
AV/C PRINTER SUBUNIT CHECKS IF PDL IS INTERPRETABLE
ST4
GENERATE CAPTURE COMMAND HAVING VALUE OF PRINT DATA SPECIFYING INFORMATION REWRITTEN
CAPTURE COMMAND

FIG.13

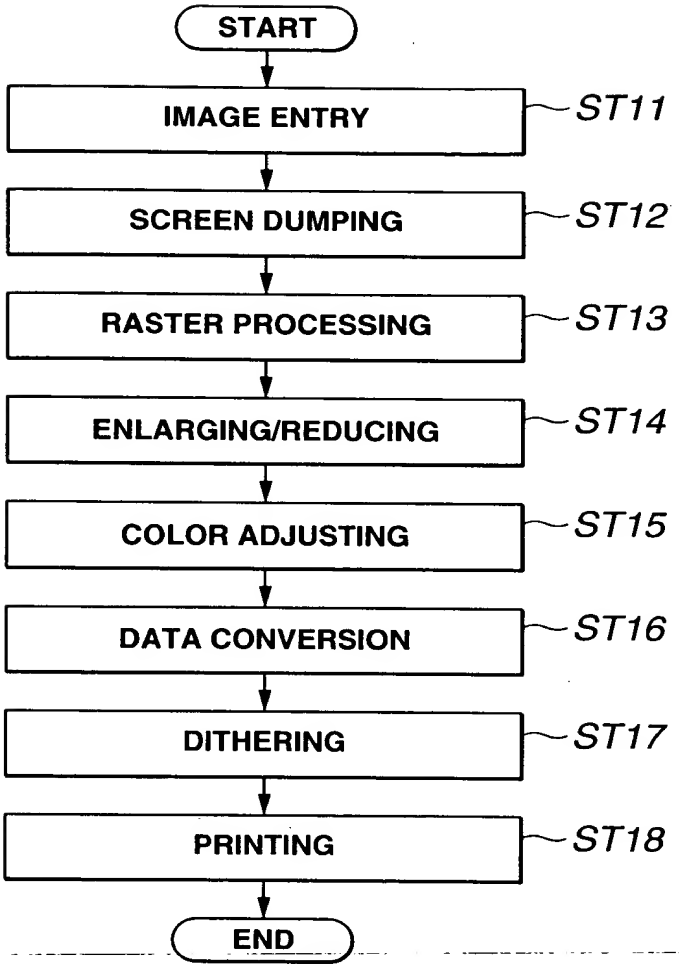
START
IMAGE ENTRY
ST11
SCREEN DUMPING
ST12
RASTER PROCESSING
ST13
ENLARGING/REDUCING
ST14
COLOR ADJUSTING
ST15
DATA CONVERSION
ST16
DITHERING
ST17
PRINTING
ST18
END

FIG.14

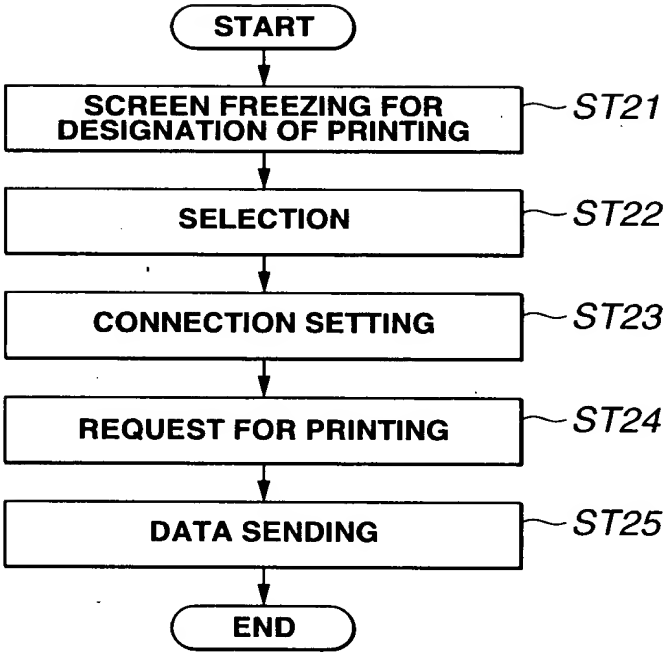
START
SCREEN FREEZING FOR DESIGNATION OF PRINTING
ST21
SELECTION
ST22
CONNECTION SETTING
ST23
REQUEST FOR PRINTING
ST24
DATA SENDING
ST25
END

FIG.15

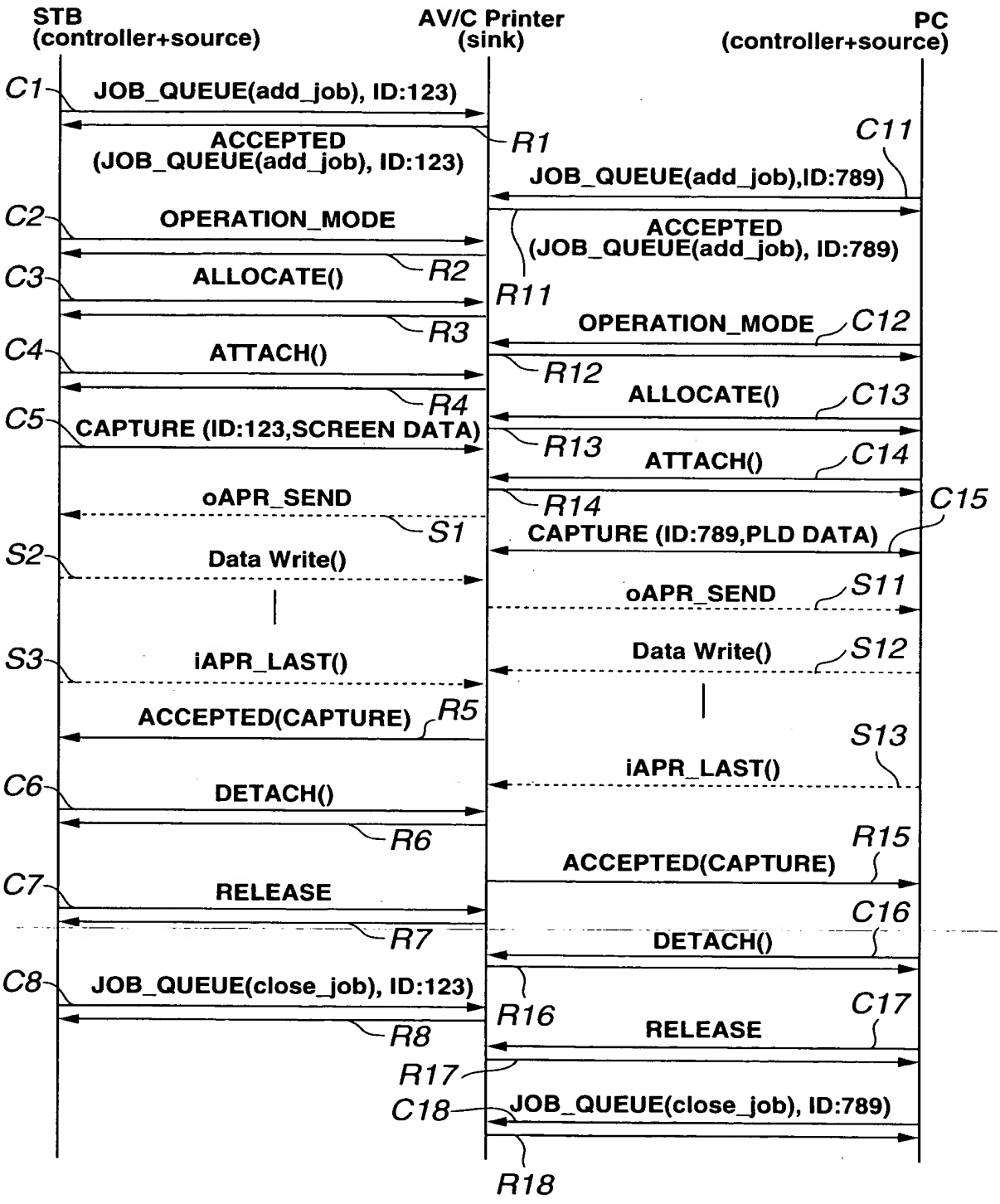
STB
(controller+source)
AV/C Printer
(sink)
PC
(controller+source)
C1
JOB_QUEUE(add_job), ID:123)
ACCEPTED
(JOB_QUEUE(add_job), ID:123)
R1
C11
JOB_QUEUE(add_job),ID:789)
C2
OPERATION_MODE
ACCEPTED
(JOB_QUEUE(add_job), ID:789)
R2
C3
ALLOCATE()
R11
R3
OPERATION_MODE
C12
C4
ATTACH()
R12
R4
ALLOCATE()
C13
C5
CAPTURE (ID:123,SCREEN DATA)
R13
ATTACH()
C14
oAPR_SEND
R14
C15
S1
CAPTURE (ID:789,PLD DATA)
S2
Data Write()
oAPR_SEND
S11
S3
iAPR_LAST()
Data Write()
S12
ACCEPTED(CAPTURE)
R5
S13
iAPR_LAST()
C6
DETACH()
R6
R15
ACCEPTED(CAPTURE)
C7
RELEASE
C16
R7
DETACH()
C8
JOB_QUEUE(close_job), ID:123)
R16
C17
R8
RELEASE
R17
C18
JOB_QUEUE(close_job), ID:789)
R18

FIG.16

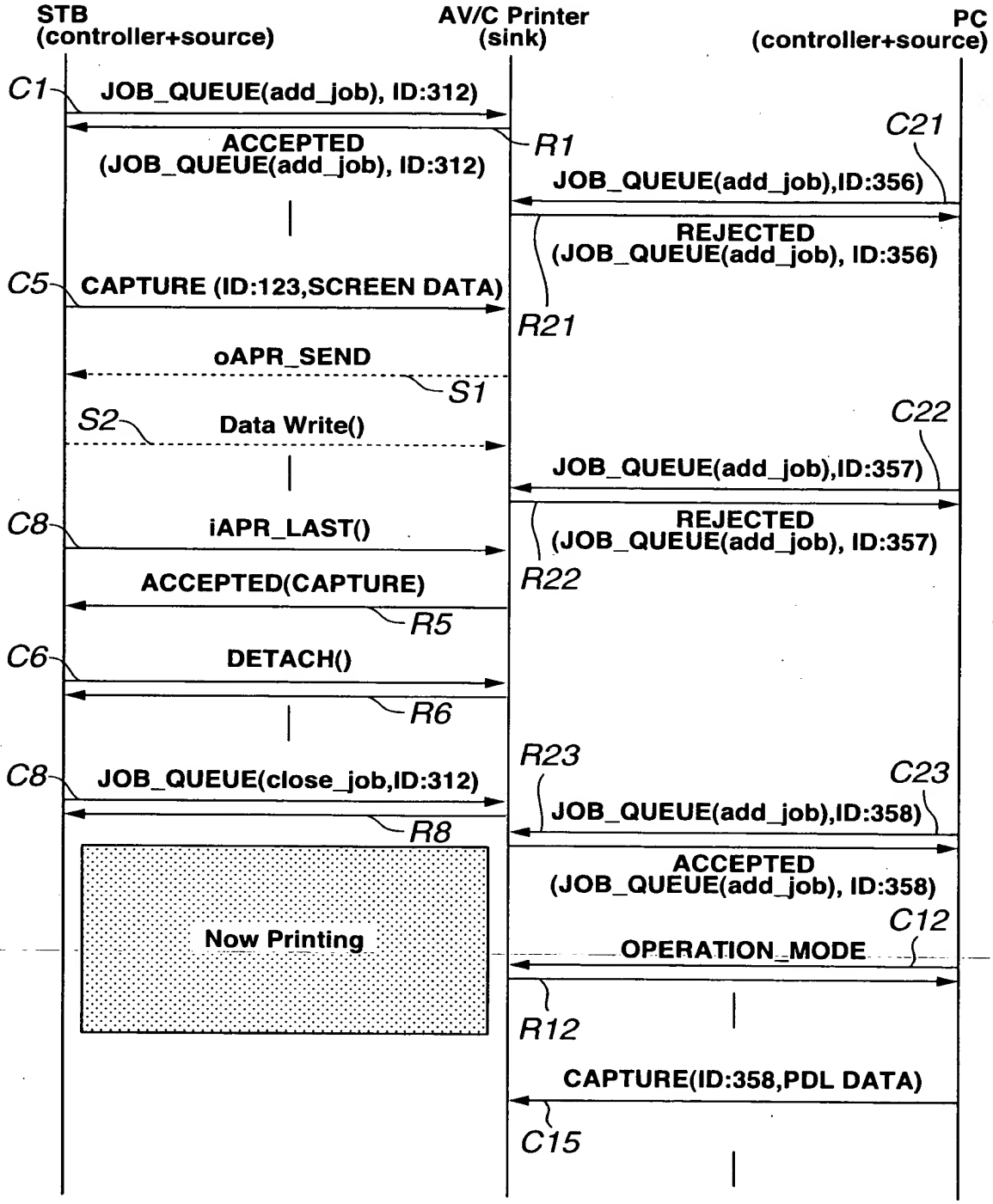
STB
(controller+source)
AV/C Printer
(sink)
PC
(controller+source)
C1
JOB_QUEUE(add_job), ID:312)
ACCEPTED
(JOB_QUEUE(add_job), ID:312)
R1
C21
JOB_QUEUE(add_job),ID:356)
REJECTED
(JOB_QUEUE(add_job), ID:356)
C5
CAPTURE (ID:123,SCREEN DATA)
R21
oAPR_SEND
S1
S2
Data Write()
C22
JOB_QUEUE(add_job),ID:357)
C8
iAPR_LAST()
REJECTED
(JOB_QUEUE(add_job), ID:357)
R22
ACCEPTED(CAPTURE)
R5
C6
DETACH()
R6
C8
JOB_QUEUE(close_job,ID:312)
R23
C23
JOB_QUEUE(add_job),ID:358)
R8
ACCEPTED
(JOB_QUEUE(add_job), ID:358)
Now Printing
C12
OPERATION_MODE
R12
CAPTURE(ID:358,PDL DATA)
C15

FIG.17

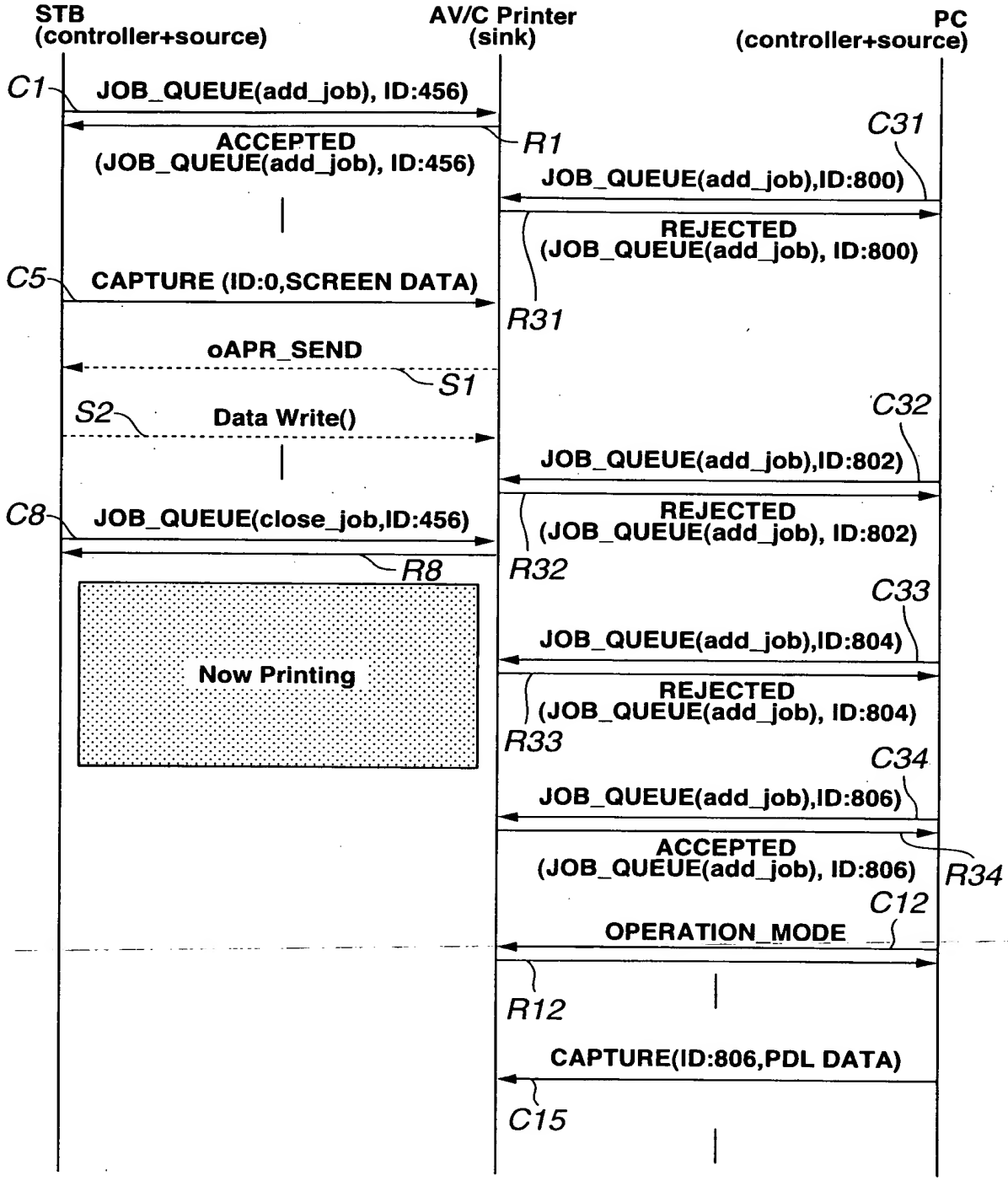
STB
(controller+source)
AV/C Printer
(sink)
PC
(controller+source)
C1
JOB_QUEUE(add_job), ID:456)
ACCEPTED
(JOB_QUEUE(add_job), ID:456)
R1
C31
JOB_QUEUE(add_job),ID:800)
REJECTED
(JOB_QUEUE(add_job), ID:800)
R31
C5
CAPTURE (ID:0,SCREEN DATA)
oAPR_SEND
S1
S2
Data Write()
C32
JOB_QUEUE(add_job),ID:802)
REJECTED
(JOB_QUEUE(add_job), ID:802)
R32
C8
JOB_QUEUE(close_job,ID:456)
R8
Now Printing
C33
JOB_QUEUE(add_job),ID:804)
REJECTED
(JOB_QUEUE(add_job), ID:804)
R33
C34
JOB_QUEUE(add_job),ID:806)
ACCEPTED
(JOB_QUEUE(add_job), ID:806)
R34
C12
OPERATION_MODE
R12
CAPTURE(ID:806,PDL DATA)
C15

FIG.18

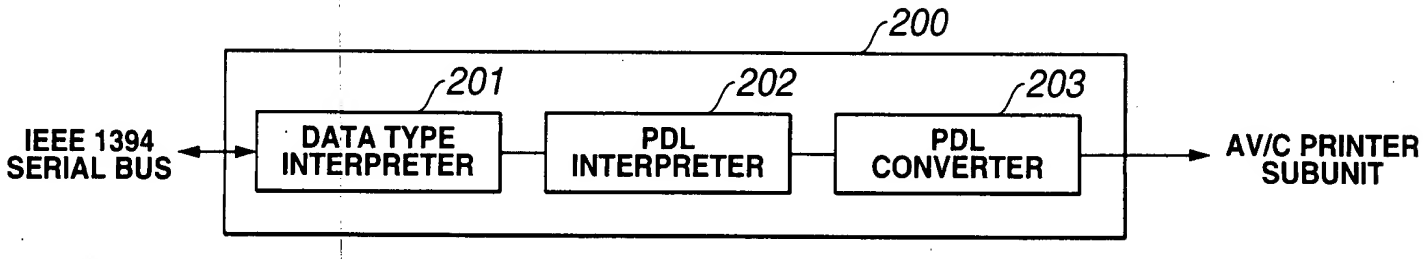
200
201
202
203
IEEE 1394
SERIAL BUS
DATA TYPE
INTERPRETER
PDL
INTERPRETER
PDL
CONVERTER
AV/C PRINTER
SUBUNIT

FIG.19